Once I got back down to the more temperate climates of Central Virginia, I felt that it was warm enough for me to spend an hour outside with my GPS. On Monday, March 19th at around 2:30, I went outside and set up my GPS receiver on top of a car in my driveway. I felt that this was a good spot considering it had height and was far enough away from the house and any trees that would get in the way. I was able to get my computer to read in the data in NMEA form without any problem. After a little more than an hour, I packed up and headed inside. Without much problem I was also able to get all the data into an excel spreadsheet. Making sure to convert from minutes and seconds to degrees, I was able to find the mean for latitude, longitude, and altitude. Then, using the spectacular capabilities of excel, I was also able to compute the standard deviation from the mean, and I found it to be:

Latitude: 3.27 meters
Longitude: 2.89 meters
Altitude: 4.84 feet

I was also able to create some graphs (on tab 3) to show in a more visual way the deviation with respect to time.
After going through this, I noticed one of the categories of NMEA data was # of satellites used at that particular moment. I was interested in how that effected the deviation, so I created a new tab (sheet 2) on my spreadsheet and copied all my data in. Then I sorted it by the number of satellites. After doing this I calculated the standard deviation under each different number of satellites, and surprisingly, the data shows that as long as there are 5 satellites, the additional number of satellites didn’t really help, in fact, in my case, the numbers were further away from the mean when you had more satellites. I suspect this is due to random error and I assume with a larger sampling under each different number of satellites you will find that they do not vary much.

I also checked the mean values of latitude and longitude by plugging them into Google earth and found that it pinpoints approximately where my driveway is. I can’t be sure because the coverage of my neighborhood on google earth is very poor. Here is the photo: